shrp PERSPECTIVE
NJDOT/SHRP IMPLEMENTATION COMMITTEE

Governor Christine T. Whitman Commissioner Frank J. Wilson

SUMMER 1995 EDITION

SHRP UPDATE (Strategic Highway Research Program)

by Frank Palise

SHRP Implementation has finished its third year. Many products in the form of equipment, test methods, specifications, guides, and reports have been released by SHRP and the FHWA Office of Implementation since the beginning of 1992. The NJDOT's SHRP Implementation Committee has been active in reviewing and evaluating many of these products. As with our first newsletter distributed in the Fall of 1993, the purpose of this newsletter is to apprise the reader of the current status of SHRP Implementation in New Jersey.

Besides the newsletter, the NJDOT Implementation Committee publishes an annual report summarizing its activities . All SHRP related reports and documents are available for viewing at the Department's Information Center at 1035 Parkway Avenue, Trenton, NJ 08625.

The librarian, Marie Emma, will provide assistance. She may be reached at 609-530-8295.

FHWA'S ROLE IN SHRP IMPLEMENTATION

by Kathy Petros

The Strategic Highway Research Program (SHRP) is a $150,000,000 product-driven research program financed under the Federal-aid highway program. SHRP was developed in a partnership with the states, American Association of State Highway and Transportation Officials (AASHTO), Transportation Research Board (TRB), industry, and the Federal Highway Administration (FHWA). SHRP included research in asphalt, concrete, and structures, highway operations, and long term pavement performance. Under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Congress fully recognized that this important program would require resources to implement the findings and authorized $108,000,000 over six years for both implementation efforts and for continuation of the Long-Term Pavement Performance Program (LTPP).

The purpose of FHWA's SHRP Products Implementation Program is to encourage and facilitate the application of those research findings that will improve the quality, efficiency, safety, performance, and productivity of our nation's highway system. The development of national implementation plans for specific products or groups of products is accomplished through four technical working groups (TWG). The TWGs are arranged in four program areas: asphalt, concrete and structures, highway operations, and long term pavement performance. The TWGs and their expert task groups (ETGs) have been meeting and providing guidance on the content, structure, delivery mechanisms and activities for the FHWA lead implementation program.

One of the challenges to the SHRP implementation process is the need to present a large number of technologies in a short period of time to a wide audience. The second challenge is to continue the high visibility that the states desired during the research phase. As such, this suggests that the widest possible audience be informed about the results.

FHWA proposes to package the SHRP technology into showcase packages and present grouped SHRP products to private and public sector engineers. The workshops will present all SHRP products with advice for further efforts provided by the TWGs. Along with presentations, there will be product demonstrations, loaner sets of equipment, videotapes, manuals, etc. Approximately 10 showcase packages are contemplated, as of this date, with five in concrete and structures, four in highway operations, and one in asphalt.

Upon completion of the Showcase workshop, the FHWA Regional office, working with headquarters, will have the opportunity to form and conduct a regional TWG with a cross section of state and industry representatives. The regional TWG in turn will evaluate the technology and develop a regional strategy for the efforts. The strategy may feed into the national effort, be self-sustaining on a regional basis, or simply become an individual state or industry effort. If there are existing organizations, such as the regional user/producer groups, they may be used in this capacity.

By no means is the SHRP implementation process limited to the showcase concept. For example, FHWA project managers have begun

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implementation activities for four LTPP spin-off products; the Distress Identification Manual, the faultmeter, falling weight deflectometer software, and the resilient modulus test procedures.

An implementation work plan for 11 of the work zone safety products has been sent to the FHWA Regions requesting State participation in the trial use of the products. The asphalt program is well underway with equipment buys, national training, mobile asphalt laboratories, etc. In each of these implementation areas, NJDOT has taken a proactive role. Updates on NJDOT's efforts can be found in this and other newsletters.

ASPHALT

by Eileen Connolly

Nationally, the efforts to implement the asphalt portion of the SHRP research are extensive. FHWA has organized a pooled fund equipment buy which allows the state DOTs to purchase the necessary equipment using federal funding. A National Asphalt Training Center was established at the Asphalt Institute to train technicians to run the test required by SHRP. Regional user/producer groups have been established to assist in maintaining uniform implementation in each Region. Superpave regional test centers are being established to lend technical and testing support to state DOTs and the asphalt industry.

In addition, AASHTO has supported the implementation effort in 1994 by publishing 12 provisional specifications relating to SHRP asphalt testing and specifications.

NJDOT's implementation efforts have included participation in the FHWA pooled fund equipment buy, the Northeast States Asphalt User/Producer Group and the National Training Center. Thus far NJDOT has received most of the asphalt binder testing equipment, but testing has not been initiated due to laboratory limitations. Plans are to begin testing in January of 1995 and to use the SHRP binder specification experimentally in the 1995 construction season.

The SHRP asphalt binder specification calls for the use of performance graded (PG) asphalts. The basis of the specification is to require certain properties of the asphalt at the temperatures at which it is to perform in-service. Therefore, the temperatures at which the asphalt is tested is varied to accommodate the expected pavement temperature. The rheology (stiffness in simple terms) of the asphalt is measured at the correct temperature using a dynamic shear rheometer at high and intermediate temperatures and a bending beam rheometer (BBR) at low temperatures. Rolling thin film oven (RTFO) and pressure aging vessel (PAV) conditioning are used to age the asphalt.

The Brookfield viscometer is used on the unaged asphalt to assess its pumpability.

Because the PG grades are based on climatic conditions, it can be anticipated that different grades will be used in different parts of the state. The coldest areas would require asphalts which do not become brittle at colder temperatures. Also there is a provision to increase the high temperature grade in areas with slowing or standing traffic to help resist rutting. As a result, in New Jersey approximately 4 PG grades are being considered.

HIGHWAY OPERATIONS AND MAINTENANCE

by Rich Balgowan

One of the fields included in the highway operations and maintenance Area of the Strategic Highway Research Program, is snow and ice control. A SHRP study involving snow and ice control was SHRP IDEA-018 (Anti-icing). Anti-icing is a concept where chemicals (e.g. sodium chloride) are applied to the roadway to prevent the bond of ice/snow to the pavement and keep accumulating snow in a plowable condition at all times. Applied proactively in this manner, the chemical acts as a chemical freezing-point depressant to minimize the formation of the ice-pavement bond. In addition, anti-icing practices reduce the task of clearing of the roadway to a bare pavement condition and requires smaller chemical amounts than are generally required under conventional deicing practices. The NJDOT currently has a anti-icing policy.

Chemicals used for pretreatment must be able to stay on the pavement surface for a reasonable period of time without rolling off or being displaced by traffic. Liquids and solid chemicals of fine gradation are typical chemicals that can be used for pretreatment. Pretreatment has many potential benefits. For example, when dew point temperatures approach pavement temperatures, condensation can form on the pavement surface. If the surface temperature is at or below freezing, the condensation becomes a solid (hoar frost/black ice) and is an extreme hazard to motorists. Bridges are most susceptible to this condition. Pretreatment can prevent hoar frost/black ice from forming. In addition, maintenance crews can apply anti-icing technology to sections of highway that may be difficult to treat during a winter weather event. All four regions have areas that fall into this category. For example, in Region 4, the roads leading to the Walt Whitman Bridge would be a candidate for anti-icing under this pretext.

This winter NJDOT will be performing an evaluation of pretreatment technology. All four regions of the state will be involved in the evaluation. Liquid potassium acetate will be applied directly to a test section of pavement and evaluated as a pretreatment agent. In addition, a fine gradation of sodium chloride prewetted and liquid potassium acetate will be used. As an additional benefit, we will attempt to monitor the corrosive effects of these chemicals as acetates are known to be corrosion inhibitors.

If anyone has any questions or has an interest in becoming involved in this research effort, please feel free to contact me at (609) 695-4734.

THE RIGHT PLACE FOR SPS-8 PAVEMENT

by Harry Schmerl

In 1992, the Federal Highway Administration began recruiting state DOT's as participants for the Strategic Highway Research Program - Long Term Pavement Performance (SHRP - LTPP) SPS-8 project - "The Study of Environmental Effects on Pavements in the Absence of Heavy Loads." The Port Authority of New York and New Jersey came to the rescue because the states can't afford to construct untrafficed pavements. Such pavements are the shoulders and jet blast erosion pavements placed adjacent to the taxiways and runways at all of its major airports.

During the 1992 AASHTO Joint Task Force on Pavements meeting, the Port Authority's Chief Civil Engineer offered a Port Authority site for one of the FHWA's SPS-8 projects. The same offer was subsequently repeated to the NJDOT during a New Jersey Interagency Engineering Committee (NJIAEC) meeting.

New Jersey DOT accepted the offer and became the Port Authority's sponsor for the project. The NJDOT also arranged to have federal funds transferred to the Authority to offset the project's start-up costs.

When all required authorizations for the project were completed, the relocation work for the major taxiways at John F. Kennedy International Airport (JFK) associated with the expansion of the American Airlines terminal was under way. As part of the contract, the Authority prepared two asphalt concrete pavement sections meeting both FAA and SPS-8 criteria: one section was 12 inches deep and one section was 17 inches deep.

After finalizing the details and addressing the concerns of the FHWA's LTPP program staff, four 600-foot-long sections were accepted for implementation in the SPS-8 program. Two Port Authority designed pavements of differing thicknesses were also included as supplements to the testing program.

Working with FHWA consultants, the Authority's engineers conducted numerous tests of the subgrade, base course, and asphalt concrete pavement. Tests included split spoon sampling, in-place density, thin walled tube sampling, moisture content, cores, etc. Bulk samples of each material were also taken to the Authority's materials laboratory for testing.

The construction of the test sections was completed in June of 1993. In December, 1993, SHRP used a profilometer to measure surface deflection and record profiles for each of the test sections.

Where are we now? The Civil Design Unit of the Port Authority Engineering Department is working with FHWA's consultants to develop a procedure to transfer climatic data from the JFK weather station to the LTPP SPS-8 climatic database. The Materials Engineering Division of the Port Authority is maintaining the FHWA specified testing and monitoring program.

The agency's SAAB friction testing will also be used to conduct periodic pavement skid tests. Collection of the weather data and the SPS-8 pavement evaluation information will continue for the next 20 years.

ASPHALT EXPERT TASK GROUPS

By Eileen Connolly

FHWA has formed an Asphalt Technical Working Group (TWG) and three expert taskg groups (ETG) to deal with technical issues and the implementation of the SHRP asphalt research. The ETG's are for asphalt binder, asphalt mixture and models. The asphalt binder ETG is to deal with binder issues, the Asphalt Mixture with mixture issues, and the models ETG with the SuperPave software and the models used in the software. SuperPave stands for Superior Performing Pavements and is both the software package and the mix design system.

The Asphalt Mixture ETG has met three times and is currently evaluating a number of outstanding issues. Because there is a limitation on the availability of equipment at this time, the ETG is focussing on the less equipment intensive aspects of the asphalt mixture specification. These include an evaluation of the recommended moisture sensitivity test (AASHTO T-283), an analysis of the aggregate consensus requirements and an analysis of the short term aging procedure.

The aggregate consensus requirements include many of the tests which are already required by most state DOTs as well as innovative tests. The aggregate properties which are of concern are coarse aggregate angularity (measured by crushed count); fine aggregate angularity (measured using the National Aggregate Association test method); flat, elongated particles (ASTM D-4791); clay content (AASHTO T-176); toughness (AASHTO T-96); soundness (AASHTO T-104); deleterious materials (AASHTO T-112) and gradation.

The Asphalt Mixture ETG's goals are to evaluate the mixture specifications to determine the practicality and to resolve issues which become apparent during implementation. It is anticipated that some changes in the specification will result from the work of the ETG.

NORTHEAST STATES ASPHALT USER/PRODUCER GROUP (NESAU/PG)

By Eileen Connolly

The NESAU/PG is the Northeast's regional user/producer group which was formed to bring together asphalt users (DOTs, municipalities and transportation authorities) and asphalt producers (suppliers,

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refineries). The goals of the group are to oversee the implementation of the SHRP asphalt research and to promote the quality of asphalt in the region. Nationally there are five regional user/producer groups who interact through a coordination effort supported by FHWA. The NESAU/PG has held informational meetings over the last several years regarding both the SHRP asphalt binder and the SHRP asphalt mixture specifications. The most recent meeting was held on October 14, 1994 in White Haven, PA and was well attended by the 11 northeastern states who are represented. For more information about the group, interested parties may contact one of the following:

Wayne Brule
NYDOT - Materials Bureau
(518) 457-3240

or

Frank Fee
Koch Materials
(609) 428-8808

SPS-9A VALIDATION

by Frank Palise

The NJDOT has submitted a nomination to the FHWA's LTPP division to construct an SPS-9A project. This SPS category is designed to validate SHRP's Superpave binder specification and related test procedures. This project will be located in the east bound lanes of I-195 between milepost 5.0 and 12.195. The surface course will be at least 2 1/2" in thickness with the binder course 2 to 2 1/2" thick.

Each test site will consist of a 500 foot monitoring section and a 500 foot transition section. A total of five sites will be constructed consisting of:

- Agency Mix (I-4 Modified)
- Superpave (PG grade 52-22)
- Superpave (PG grade 58-22)
- Superpave (PG grade 64-22)
- Superpave (PG grade 76-22)

It is anticipated that construction will commence in the spring of 1996.

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